

REMARKS

I. Status of the Claims

Claims 1 – 9, 13 – 15, and 17 are currently pending in the present application, with claims 1 and 8 being independent. Claims 1 – 17 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Application Publication No. 2003/0118876 (“Sugiura”).

By way of this amendment, claims 10 – 12 and 16 have been canceled. Further, claims 1, 8, and 13 – 15 have been amended. Support for the amendments to claims 1 and 8 may be found in at least paragraphs [0065] – [0066] and FIGs. 8 and 9 of the application as published. Support for the amendments to claims 13 – 15 may be found in at least claims 5 – 7 as originally filed. No new matter has been added.

Additionally, the Applicants respectfully request that the specification be amended, as shown above, to correct minor typographical errors. No new matter has been added.

The Applicant respectfully requests reconsideration of the above rejections in view of the foregoing amendments and the following remarks.

II. Statement of Substance of Examiner Interview

The Applicants wish to thank Examiner Barrow and SPE Yuan for taking time to meet with Applicant’s representative for a personal interview on March 15, 2010. In compliance with M.P.E.P. 713.04, Applicants provide this Statement of Substance of Interview concerning the personal interview conducted on March 15, 2010, with Amanda Barrow, Supervisory Patent Examiner Dah-Wei Yuan, and Bryan Nese.

- (A) Exhibits. No exhibit was shown. No demonstration was conducted.
- (B) Claims. Claim 1 was discussed.
- (C) Prior art. U.S. Patent Application Publication No. 2003/0118876 (“Sugiura”).
- (D) Amendments. Those suggested in a continuation sheet provided to the Examiner via facsimile.
- (E) Principal arguments of Applicant. Applicant’s representative argued that Sugiura failed to disclose a fuel cell system that starts and stops operation of a fuel cell based on a comparison of a driving power with a reference value and the driving power with a power remaining in a

storage device. The Examiners were not persuaded by this argument and maintained the § 102 rejection.

(F) Other matters. N/A.

(G) Results. Agreement was reached that the rejection of claim 1 would stand without further remarks and/or amendments.

III. Remarks Regarding Independent Claims 1 and 8

Claims 1 – 17 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Sugiura.

The Applicants respectfully submit that claim 1 is patentable over the cited references at least because it recites, in part, “*a threshold value adjusting device for adjusting a reference value according to an output voltage of the fuel cell, such that the reference value decreases as the output voltage of the fuel cell decreases.*” (emphasis added)

The Applicants respectfully submit that claim 8 is patentable over the cited references at least because it recites, in part, “*wherein the reference value is adjusted by a threshold value adjusting device that adjusts a reference value according to an output voltage of the fuel cell, such that the reference value decreases as the output voltage of the fuel cell decreases.*” (emphasis added)

The present invention provides a fuel cell system. A fuel cell system in accordance with claim 1, for example, includes a fuel cell, an electric power storing device (such as a secondary battery), an electric power supplying device for supplying power from the fuel cell and storing device to a load, and a threshold value adjusting device for adjusting a reference (*i.e.* threshold) value. One objective of a system in accordance with this claim is to operate the fuel cell as efficiently as possible. In order to achieve this, the system supplies power to a load (such as the motor of a vehicle) either by an intermittent mode or a continuous mode. In the continuous mode, power is supplied to the load from the fuel cell and, in certain circumstances, the power storing device. In intermittent mode, power is supplied to the load from the power storing device

only.

A system in accordance with this claim may also provide a fuel cell control (shown in Figure A below) for determining when the system should switch between intermittent and continuous modes. For example, the control may dictate that the system will operate in intermittent mode (*i.e.* supplying power to the load from the storing device only) when both of the following conditions are met: (1) the amount of power required by the load is less than a reference value; and (2) the storing device has at least enough power remaining to meet this demand. When at least one of these conditions is not met, the system will operate in continuous mode (*i.e.* the fuel cell applies power to the load).

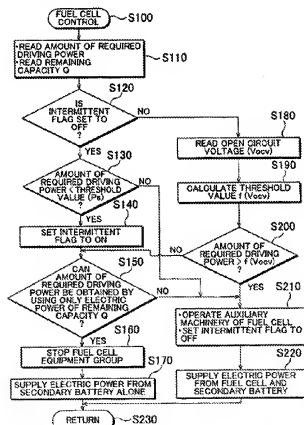


Figure A: FIG. 7 of the Present Application

The reference value of condition (1) above may be, for example, a minimum value for efficient operation of a fuel cell. In other words, a fuel cell operating below this value would no longer be operating efficiently, and it is desirable to operate in intermittent mode. However, this value may change during operation of the fuel cell. For example, a reference value that is

appropriate for a fuel cell that has been operating for a substantial amount of time may not be a proper benchmark for a fuel cell that has only been operating for a relatively short amount of time.

In order to more effectively determine an appropriate reference value, certain embodiments of the present invention provide a threshold value adjusting device. One example of this device alters the reference value based on the voltage output of the fuel cell. As shown in Figure B below, this exemplary device decreases the reference (*i.e.* threshold) value as the voltage output (*i.e.* open circuit voltage) of the fuel cell decreases. Similarly, as the fuel cell's voltage output increase, the reference value increases.

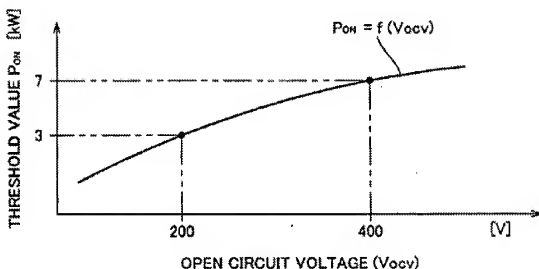


Figure B: FIG. 8 of the Published Application

Sugiura, on the other hand, discloses a power supply apparatus having a fuel cell and a capacitor. The apparatus also includes fuel cell mode determination means for determining when to operate in an "FC suspended mode" (similar to an intermittent mode) or a normal mode in which only the fuel cell supplies power. Sugiura's determination means measures a voltage from the capacitor and compares this voltage with a reference voltage. Based on this comparison, the determination means either opens or closes switches that connect the fuel cell to a load. As shown in Figure C below, Sugiura teaches altering the reference voltage based on the rate of increase of the voltage of the capacitor (dV_c/dt). Note that, as shown in Figure C below and described in paragraph [0081] of Sugiura, the reference voltage increases as the capacitor voltage rate decreases.

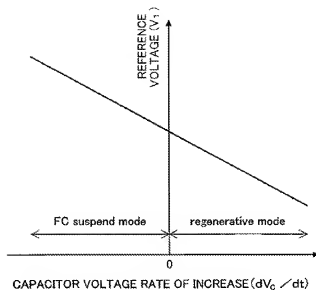


Figure C: FIG. 8 of Sugiura

The two devices are distinct, as is apparent from the above description and figures. Specifically, there are numerous differences between the calculation of the reference values in the two systems. In determining a reference value in each of the above systems, different components of the system are measured. In the present application, the *fuel cell's* voltage output is measured; in Sugiura, the *capacitor's* increase in voltage over time is observed. Additionally, the two quantities themselves are different: *voltage output* in the present application; *voltage rate of increase over time* in Sugiura. Further, the correlation between the respective variables in both systems are different. In the present application, the reference value *increases* with increasing voltage output; in Sugiura, the reference value *decreases* with increasing dV_c/dt .

Accordingly, without waiving any argument, and to advance prosecution, the Applicants have provided additional limitations to claims 1 and 8 that highlight these distinctions. By way of the above amendment, the Applicants submit that Sugiura fails to teach each and every element of claims 1 and 8. Specifically, Sugiura fails to show “*a threshold value adjusting device for adjusting a reference value according to an output voltage of the fuel cell, such that the reference value decreases as the output voltage of the fuel cell decreases.*” The Applicant respectfully submits that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Accordingly, the Applicants respectfully request that the § 102 rejection over Sugiura be withdrawn.

IV. **Conclusion**

In light of the above remarks, the Applicants respectfully submit that the present application is in condition for allowance. The Applicants earnestly solicit favorable reconsideration and issuance of a Notice of Allowance.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. **The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.**

Respectfully submitted,

Date: May 10, 2010

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